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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,215	04/24/2001	Akira Kubota	IPE-004	3140

20374 7590 05/17/2004

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EXAMINER	
UHLIR, NIKOLAS J	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 05/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Applicant(s)	
	09/830,215	KUBOTA ET AL.	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response the arguments dated 2/09/2004. Applicant's arguments have been fully considered and are persuasive in overcoming the prior grounds of rejection. Accordingly, the prior grounds of rejection are withdrawn. However, the application is not in condition for allowance in view of the new grounds of rejection set forth below.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-9, 11-15, 17-19, 23-24, and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (EP0522758) in view of Hatada et al. (US4732814).

4. Claim 1 requires a biaxially oriented film comprising a film of a polymer alloy composed of polyester (polymer 1) and a thermoplastic resin (polymer 2) other than the polyester as essential components, wherein microprotrusions having a height of 2-50nm are formed at a density of 1e6 to 9e7 microprotrusions/mm^2 on at least one surface.

5. Regarding these limitations, Yamamoto teaches a surface roughened film comprising a thermoplastic polyester resin A (equivalent to applicant's claimed polyester), and a thermoplastic resin B (equivalent to applicants claimed thermoplastic resin). Thermoplastic resin B has a higher glass transition temperature than the polyester resin A (page 3, lines 18-25). Specific materials for thermoplastic polyester A include polyethylene terephthalate (PET), and polyethylene naphthalate (PEN) (page 4,

lines 12-15). Further, the film of Yamamoto is biaxially oriented (page 8, lines 50-55). BY biaxially orienting the film, fine irregularities (equivalent to microprotrusions) are formed on the surface of the film (page 6, lines 62-37). The film of Yamamoto is suitable for use as a substrate for a magnetic recording medium (page 2, lines 5-8).

6. Yamamoto fails to teach density and height of protrusions required by claim 1.

7. With respect to this deficiency, Hatada teaches that the number and height of protrusions on the surface of a biaxially oriented film that is used as a substrate for a magnetic recording medium has an impact on the conversion characteristics and running properties of the film (column 7, lines 28-50). Specifically, Hatada teaches that 10-50 protuberances/μm^2 (10e6-5e7 protuberances/mm^2) should be present on the surface of the film, and the protuberances should have a height in the range of 5-30nm (column 7, lines 28-50). If less than 10e6 protuberances/mm^2 are on the surface, the running property of the film degrades whereas if greater than 5e7 protuberances/mm^2 are on the surface, the surface roughness increases and dropout is caused (column 7, lines 40-50). If the protuberances have a height less than 5nm, the running property of the film is poor, whereas if the protuberances have a height greater than 30nm, the electromagnetic conversion characteristics of the medium are degraded (column 7, lines 29-40).

8. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form 10e6-5e7 protuberances/mm^2 having a height in the range of 5-30nm as taught by Hatada on the surface of the biaxially oriented film taught by Yamamoto.

9. One would have been motivated to make this modification in view of the fact that the Yamamoto film is designed to be utilized as a magnetic media substrate, and the fact that Hatada teaches that biaxially oriented films that are used as magnetic recording media substrates should have 10e6-5e7 protuberances/mm^2 having a height of 5-30nm on their surface so that they will have good running properties and conversion characteristics.

10. Claim 2 further refines the number of protrusions required to 3e6-6e7 protuberances/mm^2. This limitation is met as set forth above for claim 1.

11. Claim 3 further refines the height of the protrusions required to 2-30nm. This limitation is met as set forth above for claim 1.

12. Claims 4-5 requires at least some of the micro protrusions, more specifically $\geq$30% of the microprotrusions to be made of polymer 1 or polymer 2. Yamamoto teaches that the protuberances on the film surface are cored with thermoplastic resin b (polymer 2) (page 4, lines 38-40). Though Yamamoto doesn't specifically teach the required 30%, the examiner takes the position that this limitation is met, as from the language of Yamamoto it is logical to believe that most if not all of the protuberances on are cored from polymer b.

13. Claim 6 requires polymer 2 to have a higher glass transition temperature than that of polymer 1. This limitation is met as set forth above for claim 1.

14. Claims 7 and 8 requires polymer 2 to be compatible with polymer 1, more specifically where polymer 2 comprises a thermoplastic resin selected from polyimide, polysulfone, and polyethersulfone. Yamamoto teaches that thermoplastic polyester A is

selected from PET, PEN, PCT< and PEOB resins (page 4, lines 12-23). Further, thermoplastic resin b is selected from polystyrene, polymethyl methacrylate, polycarbonate, polyarylate, polyethersulfone, maleimide (a known polyimide), and others (page 5, lines 13-15).

15. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize PET as thermoplastic polyester A and either polyethersulfone or maleimide as thermoplastic resin b in Yamamoto, as Yamamoto recognizes the equivalency of PET to the other materials listed as suitable for use as thermoplastic polyester A, and recognizes the equivalency of polyethersulfone or maleimide to the other materials listed as suitable for use a thermoplastic resin b.

16. It is noted that the applicant in the specification lists polyethersulfone, polyimide, and polysulfone as being compatible with PET (see page 9). Thus, the limitations of claims 7 and 8 are met.

17. Claim 9 requires polymer 2 to be polyimide. This limitation is met as set forth above for claims 7-8.

18. Claim 11 requires polymer 1 to be PET. This limitation is met as set forth above.

19. Claims 12-13 require the number of protrusions having a height of ≥50nm to be ≤3000/mm^2, and the number of protrusions having a height ≥30nm to be ≥1500/mm^2. Hatada as set forth above teaches away from forming protuberances having a height >30nm. Specifically, Hatada teaches that if the protuberances have a height greater than 30nm, the electromagnetic conversion characteristics of the medium are degraded (column 7, lines 29-40).

20. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the height of all of the protrusions on the surface of the film taught by Yamamoto as modified by Hatada to be less than 30nm, as Hatada teaches that if protuberances having a height >30nm are formed, the electromagnetic conversion characteristics of the film are degraded.

21. Claim 14 requires the film of claim 1 to be laminated as at least one outermost layer of a base layer. Yamamoto specifically teaches an embodiment where the film as described above for claim 1 is formed on one or both sides of a base layer (page 3, lines 29-35).

22. Claim 15 requires the film of claim 14 to have a third layer formed on the opposite side of the base layer. Yamamoto teaches a specific example meeting this requirement (page 24 example 30 and page 3, lines 29-35).

23. Claims 17, 31, and 32 require the base layer to comprise polymer 1 or a mixture of polymer 1 and polymer 2, more specifically where the base layer and the A layer both comprise polyester (claim 31) or the same material (claim 32). These limitations are met as set forth above for claim 15, as example 30 of Yamamoto clearly utilizes PET as polymer 1 in the outer layers and as the only component of the base layer

24. Claims 18 and 19 require essentially the same limitations as claims 12 and 13, only in a three-layer film. These limitations are met as set forth above for claims 12-15.

25. Claims 23-24 require the A layer to contain 0.0001-2% by weight of inert particles having an average particle diameter of 0.01-2μ (claim 23), more specifically 0.01-1% by weight particles having a diameter between 0.01-1μ. Yamamoto teaches adding 0.0001-

0.1% by weight of inert particles that have an average diameter between 0.02-4μ to the polymer composition making up the "A" layer in Yamamoto (page 3, lines 39-35). Thus, as 0.1% by weight and 0.2μ are fully encompassed by the applicant's claimed ranges, the limitations of claims 23 and 24 are met.

26. Claims 27-29 require a magnetic layer to be laminated on one side of the polymer base film of claim 1 (claim 27), more specifically a ferromagnetic metal thin film (claim 28), or a magnetic layer comprising magnetic particles in a binder (claim 29). As set forth above, Yamamoto teaches that biaxially oriented film is suitable for use as a base for a magnetic recording medium. Further, Hatada teaches vapor depositing a ferromagnetic layer (equivalent to applicants claimed thin film magnetic layer) or applying a binder containing ferromagnetic particles to the surface of biaxially oriented polyester so as to form a magnetic recording layer (column 7, lines 1-*7 and column 12, lines 20-34).

27. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a ferromagnetic thin film magnetic layer or a magnetic layer comprising a binder and ferromagnetic particles as taught by Hatada on the surface of the biaxially oriented film of Yamamoto

28. One would have been motivated to make this modification in view of the fact that Yamamoto explicitly states that the biaxially oriented film is suitable for use as a magnetic recording medium, and the fact that Hatada teaches that ferromagnetic vapor deposited films or binders containing ferromagnetic particles are suitable for forming a magnetic layer on a biaxially oriented substrate.

29. Claims 1-6, 11, 14-15, 17, 20-22, 27, and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinonome et al. (EP0398075) in view of Hatada et al. (US4732814).

30. Regarding claims 1-3, Shinonome teaches a biaxially oriented polymer film comprising a thermoplastic polyester A (equivalent to applicant's claimed thermoplastic polyester) and a thermoplastic polyamide B (equivalent to applicants claimed polymer 2) 9page 3, lines 1-5). Suitable materials for thermoplastic polyester A include PET< and PEN (page 3, lines 8-10). Further, the film is biaxially oriented (page 4, lines 10-25). When the film is oriented, protuberances are formed on the surface of the film. Shinonome teaches that the film is suitable for use as a base for a recording medium (page 3, lines 44-55)

31. Shinonome fails to teach the require density and height of protrusions required by claims 1-3.

32. With respect to this deficiency, Hatada teaches that the number and height of protrusions on the surface of a biaxially oriented film that is used as a substrate for a magnetic recording medium has an impact on the conversion characteristics and running properties of the film (column 7, lines 28-50). Specifically, Hatada teaches that 10-50 protuberances/μm^2 (10e6-5e7 protuberances/mm^2) should be present on the surface of the film, and the protuberances should have a height in the range of 5-30nm (column 7, lines 28-50). If less than 10e6 protuberances/mm^2 are on the surface, the running property of the film degrades whereas if greater than 5e7 protuberances/mm^2

are on the surface, the surface roughness increases and dropout is caused (column 7, lines 40-50). If the protuberances have a height less than 5nm, the running property of the film is poor, whereas if the protuberances have a height greater than 30nm, the electromagnetic conversion characteristics of the medium are degraded (column 7, lines 29-40).

33. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form 10e6-5e7 protuberances/mm^2 having a height in the range of 5-30nm as taught by Hatada on the surface of the biaxially oriented film taught by Shinonome.

34. One would have been motivated to make this modification in view of the fact that the Shinonome is designed to be utilized as a magnetic media substrate, and the fact that Hatada teaches that biaxially oriented films that are used as magnetic recording media substrates should have 10e6-5e7 protuberances/mm^2 having a height of 5-30nm on their surface so that they will have good running properties and conversion characteristics.

35. Regarding claims 4-5, Shinonome teaches that the thermoplastic polyamide has a higher Tg than the thermoplastic polyester (page 3, lines 17-19).

36. Regarding claim 11, Shinonome specifically teaches the use of PET as the thermoplastic polyester.

37. Regarding claims 14-15, Shinonome teaches forming a multiplayer structure wherein a film comprising the composition stated above for claim 1 is laminated on one

or both sides of a second film to form an AB or ABA structure. As written claim 15 is open to layer A and layer C being the same material. Thus, this limitation is met.

38. Regarding claims 17 and 31-32. Shinonome teaches that the base layer of the multilayer system can be PET, which is the same as polymer 1 utilized in the coating layer (page 4, lines 4-10).

39. Regarding claims 20-21, wherein the applicant requires specific amounts of polymer 2 in layer A and layer B. Page 4, lines 4-10 of Shinonome establish that the base layer of the AB or ABA structure of Shinonome does not contain any thermoplastic polyamide. Thus, Wb =0. Further, Shinonome teaches that the amount of thermoplastic polyamide in the coating layer (A) impacts the surface roughness of the layer, wherein as the amount of thermoplastic polyamide increase, the roughness increases and vice versa. Thus, the amount of thermoplastic polyamide in the film of Shinonome is a results effective variable.

40. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the amount of thermoplastic polyamide in the coating of Shinonome in order to achieve a film having a desired surface roughness.

41. Regarding claim 22, Shinonome teaches that inert filler such as kaolin "may" be incorporated into the coating layer. Thus, it is clear that inert fillers are not included the most basic embodiment of Shinonome.

42. Regarding claim 27, Shinonome specifically teaches the use of the polyester film as a base material for a magnetic tape (page 2, lines 1-3).

43. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a magnetic layer over the polyester film taught by Shinonome, as magnetic tapes comprising a polymer film substrate and a magnetic layer formed over the polymer film substrate are old and well known in the art.

44.

45. Claims 1-3, 9-10, 14-16, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. (US5527594) in view of Hatada et al. (US4732814).

46. Regarding claims 1-3, Kinoshita teaches an optical tape that comprises a polyester film substrate, a coating layer (A) formed on one side of the substrate, and a coating layer (B) formed on the other side of the substrate (column 2, lines 40-52). The film is used as a base for a magneto-optical recording medium (column 24, lines 18-25). The A layer is composed of a resin binder and a lubricant (column 4, lines 32-33). Suitable lubricants include vertical protuberance forming resins such as polyamide, polyacrylate, polysulfone, etc. (column 4, lines 40-50). Suitable resin binders include polyesters (column 5, lines 43-50 and column 6, lines 7-17). The film is biaxially stretched (column 7, lines 53-67), and protuberances are formed on its surface (column 5, lines 17-29). Further, Kinoshita teaches that various additive resins may be incorporated into the A layer so as to prevent oligomer deposition. Suitable additives include polyetherimide (column 15, lines 32-38 and column 17, lines 17-21).

47. Kinoshita fails to the density and height of the protrusions required by claims 1-3.

48. With respect to this deficiency, Hatada teaches that the number and height of protrusions on the surface of a biaxially oriented film that is used as a substrate for a

magnetic recording medium has an impact on the conversion characteristics and running properties of the film (column 7, lines 28-50). Specifically, Hatada teaches that 10-50 protuberances/μm^2 (10e6-5e7 protuberances/mm^2) should be present on the surface of the film, and the protuberances should have a height in the range of 5-30nm (column 7, lines 28-50). If less than 10e6 protuberances/mm^2 are on the surface, the running property of the film degrades whereas if greater than 5e7 protuberances/mm^2 are on the surface, the surface roughness increases and dropout is caused (column 7, lines 40-50). If the protuberances have a height less than 5nm, the running property of the film is poor, whereas if the protuberances have a height greater than 30nm, the electromagnetic conversion characteristics of the medium are degraded (column 7, lines 29-40).

49. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form 10e6-5e7 protuberances/mm^2 having a height in the range of 5-30nm as taught by Hatada on the surface of the biaxially oriented film taught by Kinoshita.

50. One would have been motivated to make this modification in view of the fact that the Kinoshita film is designed to be utilized as a recording media substrate, and the fact that Hatada teaches that biaxially oriented films that are used as recording media substrates should have 10e6-5e7 protuberances/mm^2 having a height of 5-30nm on their surface so that they will have good running properties and conversion characteristics.

51. Regarding the combination of Kinoshita with Hatada. The examiner acknowledges that Kinoshita is drawn to a fundamentally different type of recording medium (magneto-optic) than that taught by Hatada. While one of ordinary skill in the art would clearly recognize that he recording layers of Kinoshita and Hatada are different, one of ordinary skill in the art of magnetic recording media would know that film substrates that are suitable for use in magneto-optical recording media can be substantially identical to those used for magnetic recording media using ferromagnetic recording layers. This is evidenced by the fact that both Kinoshita (magneto optic) and Hatada (magnetic) utilize biaxially oriented polyester films as substrates. Thus, one of ordinary skill in the art would have been motivated to make the proposed modification and would have a reasonable expectation of success in doing so.

52. Regarding claims 9-10, as set forth above, Kinoshita teaches that various additive resins may be incorporated into the A layer so as to prevent oligomer deposition. Suitable additives include polyetherimide (column 15, lines 32-38 and column 17, lines 17-21).

53. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to include polyetherimide in the coating composition of layer A of Kinoshita, as polyetherimide is taught to be equivalent to the other materials listed as suitable for use as an oligomer deposition prevention agent.

54. Regarding claims 14-16, wherein the applicant requires a three layer ABC structure, wherein layer A has a surface roughness Ra_a of 0.2-10nm, layer C has a surface roughness Ra_c of 1-30nm, such that $Ra_c > Ra_a$. Kinoshita teaches a 3 layer

laminate comprising a base layer, layer A as described above for claim 1, layer B (same as layer A described above but with no lubricant and equivalent to applicants claimed A layer) on the opposite side of the base from the A layer (column 13, lines 50-60, and column 2, 40-50). The A layer has a surface roughness Ra of 0.005-0.5μ, whereas the surface roughness of the B layer has a surface roughness Ra of ≤0.005μ. Thus, the limitations of claims 14-16 are met when the B layer has a surface roughness less than 0.005μ and the A layer has a surface roughness of 0.005μ.

55. Regarding claims 25-26, the examiner interprets "composed" in claim 25 as open language that allows for other components aside from polyester, and polyetherimide to be present in the film. Thus, the limitations of claims 25-26 are met as set forth above for claims 1, 9, and 16.

Response to Arguments

56. The applicant's arguments dated 02/09/2004 have been fully considered and were sufficient to overcome the previous grounds of rejection. As the previous grounds of rejection have been withdrawn, applicant's arguments are largely moot. However, applicant's argument with respect to the method by which the protuberances are formed needs to be addressed.

57. The applicant has argued that it is very difficult to form protuberances of the required height and density by the polymer alloy method. Further, the applicant argues that the polymer alloy method utilizes very different technology than other known protuberance forming methods, and that the office has not shown that one of ordinary

skill in the art would reasonably have expected the conditions and materials used in these different methods to be randomly combinable with good results.

58. The examiner acknowledges applicant's argument, but respectfully disagrees. The patentability of a product is predicated on the structure of the product, not the manner in which the product is made. While it may be difficult to form the claimed protuberances via the polymer alloy method utilized by Yamamoto and Shinonome, unless it can be shown that the prior art method cannot form the required protuberances this argument is unpersuasive. The prior art, namely Hatada, clearly recognizes that using a biaxially oriented film having the claimed number of protrusions with the claimed height as a base for a magnetic recording medium results in a medium having good running and conversion characteristics. Thus, there is clear motivation to form the required protuberances on the surface of the films of Yamamoto and Shinonome. Unless the applicant establishes that the method utilized to form the protuberances is critical to obtaining the claimed invention, a biaxially oriented film meeting the claimed composition and protuberance characteristics reads on the instant claims, regardless of how the prior art protuberances are formed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 571-272-1517. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J. Thibodeau can be reached on 571-272-1516. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

nju

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